The subject-matter is dealt with under the following heads:—General properties of matter; moulding sands; facing sands; foundry tools; moulding-boxes; handling material in the foundry; open sand moulding; cores; elementary aspects of moulding; green-sand moulding; securing cores in moulds; moulding from guides; bench, outside, and plate moulding; machine moulding; dry sand moulding; loam moulding; chill casting; casting on to other metals; weighing and binding moulds; shrinkage, contraction, and warping; dressing castings; common faults due to mould and pattern; wrought iron; cast iron; refractory materials; fuels and furnaces; mixing by analysis; further treatment of cast iron; high-temperature measurement; steel; metals other than iron; alloys; mechanical testing; micrographic analysis; common faults due to the metal; and foundry management. The illustrations, of which there are 246, have been carefully chosen, and, like the letterpress, are exceptionally well printed. From this enumeration of the contents it will be seen that, although bearing the comprehensive title of "General Foundry Practice," the work is almost entirely devoted to iron and steel founding. Metals other than iron are disposed of in some twenty pages, brass founding receiving chief attention. The ingenious *cire perdue* process of bronze casting is not mentioned, nor is the modern method of casting in sections bronze statuary of heroic size, such as Bartholdi's "Liberty" at New York and Schwanthaler's "Bavaria" at Munich. The plaster moulds used for this purpose might have been added to the green sand, dry sand, loam, and chilled moulds described by the authors. A few lines, too, might have been devoted to the moulds used for metals with low melting points, brass, slate (for toy soldiers), wood, and even paper (for stereotype plates) being employed.

As the eye of the metallurgist wanders up and down the authors' well-filled pages, it will be arrested by that section which deals with the influence of the various impurities in cast iron. Phosphorus, it is shown, increases the fluidity of cast iron and renders the metal suitable for art castings, such as those for which the Russian works at Kyschtym are famous. Sulphur tends to make castings harder and brittle. Silicon, by tending to throw the carbon out of the combined form and to make it appear in the metal as graphite, has a beneficent influence. Manganese, on the other hand, has a tendency to keep the carbon in the combined form. These facts have to be borne in mind in mixing by analysis, a method which, it is gratifying to find, is steadily replacing mixing by fracture, by guesswork, or by trial. As the underlying science of the founder's art becomes more and more clear, well-marshalled knowledge is increasingly helpful. As the authors point out, the real theoretical knowledge of the man of science is built on experiment, and his theories are tested by further experiment. The practical man constantly meets with difficulties in his work; and he also must, in a truly scientific way, devise a remedy by testing the results of his former experience. The apparatus may be cruder than that of the laboratory, but it will be used with a subtle judgment of the needs of the case. The man who combines a scientific training with practical experience is gradually, but surely, becoming the dominant type of industrial captain in the best equipped foundries.

The book is unusually free from typographical and other errors, and there is little in the arrangement of the material to which exception can be taken. It might perhaps have been well to have carried the subject a stage further, and to have given the student some information regarding the galvanising, nickel-plating, lacquering, and porcelain enamelling of castings, and regarding the repairing of faulty castings by melting in iron by means of the electric arc or the oxyhydrogen blowpipe. Pattern making is altogether ignored. It is true that it is a distinct trade involving the skill of the joiner and the turner. A practical founder should nevertheless have a general knowledge of the construction of foundry patterns; and the elaborate patterns, sharply chased in a tin-lead alloy, used for ornamental castings present many features of interest to the foundry managers and foremen for whom the work is primarily intended.

OUR BOOK SHELF.

Eversley Gardens and Others. By Miss R. G. Kingsley. Pp. x+280. (London: George Allen, 1907.) Price 6*s.* net.

R. Jones

It is always stimulating to meet with enthusiasm, and Miss Kingsley is not only an enthusiast with regard to individual plants, but possesses a keen eye for their artistic setting and arrangement. Eversley is situated on the Bagshot beds in a part of Hampshire that has received the *sobriquet* of "the rubbish-heap of the world"; and as much of Miss Kingsley's experience was gained in laying out and cultivating the garden of Keys House, in Eversley, her success may serve as a help to other amateurs whose energies are also concentrated on poor soil.

It would appear that roses have been Miss Kingsley's chief delight, especially the teas, hybrid teas, and climbers. She presents a lengthy choice, arranged in colour groups, containing besides such universal favourites as G. Narbonnand, Frau Karl Druschki, and Caroline Testout, others less generally known, as Madame Ravary, Coquette de Lyon, and Monsieur Trillier. The list of rhododendrons, a plant that finds a congenial home on the Bagshot soil, is especially noteworthy, and the plan of growing bulbs in peat fibre in bowls is recommended as a clean and rapid method for producing fine flowers. While it is probable that most gardeners will find many hints and references to species unknown to them, it is certain that all can learn much from the artistic combinations described by the author, some produced in her own garden, others in her friends' gardens.

W. E. Rolston

The Friendly Stars. By Martha Evans Martin. With introductory note by Prof. Harold Jacoby. Pp. ix+253; illustrated. (London and New York: Harper and Brothers, 1907.) Price 5*s.* net.

Evidently written by one who for years has been in the habit of looking upon the stars as companions, rather than as conglomerations of known and unknown elements, this volume will appeal to the

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beginner in astronomy and to the general reader quite as much as to the astronomer.

After dealing generally with the apparent movements and with the brightest stars, the author proceeds to thirteen chapters containing causeries on particular stars, describing the relative position of each, its seasonal apparitions, its diurnal path, and its colour, &c., adding a few words as to the distance and physical conditions of each star.

More general problems are then discussed, such as the numbers, distances, and light of the stars. A brief chapter on double stars gives an excellent first idea of multiple systems, and is followed by nine chapters dealing with the constellations, frequent diagrams illustrating the text. By those who simply wish to recognise the individuals of the starry host, and to be *au fait* with sufficient characteristics of each to mark its individuality, the volume will be found a useful companion.

W. E. R.

On the Evolution of Wound-treatment during the Last Forty Years. By Sir Hector C. Cameron, Professor of Clinical Surgery in the University of Glasgow. Pp. 96. (Glasgow: James MacLehose and Sons, 1907.)

THE appearance of this book at the present time is opportune, for the lectures deal very largely with Lord Lister's researches on antiseptic treatment, of which they form a brief history. Lister's treatment was founded on Pasteur's demonstrations and writings, and no man ever acknowledged an indebtedness more often and more unequivocally. At the commencement of the first lecture the procedure adopted in 1860, or thereabouts by Mr. Syme, the period immediately preceding the introduction of antiseptics, is detailed. In 1868 or so Lister's first method of treating wounds antiseptically was being tested by its author. This consisted in swabbing the wound with undiluted carbolic acid (a crude and impure preparation at that time) and covering it with lint saturated with the same substance, over which a piece of sheet-lead was placed; each day the lead was removed and the lint painted over with the carbolic. By such treatment, crude and simple as it may now appear, it was abundantly demonstrated that wounds, even the dreaded compound fracture, would heal without suppuration. Subsequently, a putty consisting of whiting and carbolic acid was used, and step by step carbolic gauze, corrosive sublimate, mercuric iodide, and the cyanide gauzes were evolved. The author holds that no mere dressing with dry sterilised wool or gauze, apart from germicidal solutions, will suffice to prevent suppuration in dirty wounds, and with this pronouncement many will cordially agree.

Vortex Philosophy: or the Geometry of Science Diagrammatically Illustrated. By C. S. Wake. Pp. 36. (Chicago: Published by the Author, 1907.)

"As negation is the expression of energy and position is the expression of force, the elements of undulation, which is the dynamic aspect of the molar energy light, are expansion in the atomic field and ionisation in the molecular field; and the elements of spiralisation, which is the dynamic aspect of molar force (gravitation), are contraction in the atomic field and convergence in the molecular field" (p. 20). This extract shows that Mr. Wake has an extensive vocabulary, and a fund of unconscious humour. His pamphlet has no scientific value, but is amusing in its way as an attempt to classify all human knowledge on principles ostensibly scientific and logical, but really vague and æsthetic. Even from this point of view the coloured diagrams vii. and xii. are unsatisfactory.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The August Draconids—Perseid Fireballs.

IMMEDIATELY after coming out to watch the northern sky on August 15 at 9h. 23m., I observed a second-magnitude meteor appearing stationary at the point 288° + 61°, near *o* Draconis. Four other meteors were seen directed from precisely the same position during a watch of forty minutes later on the same night, but clouds came over before 10h. 30m., and though the sky cleared at a later hour I did not look out again.

This radiant point in Draco is nearly identical with that of a brilliant shower of fifty-six slow-trained meteors which I observed on 1879 August 21 to 25. I also recorded it in several other years, but it was very feebly represented. It appears to be visible both in July and August, but though I have often eagerly awaited it, the striking activity it displayed in 1879 has never been repeated. Possibly this year it may have returned more richly than usual, and I trust other observers recorded it while watching the later stages of the Perseid shower.

The following are the positions I have obtained for the Draconic radiant in past years:—

(1)	1888,	July	8–13	...	290° + 59°	...	4 Slow.
(2)	1885,	,,	9–13	...	290 + 60	...	5 Slow.
(3)	1900,	,,	24–30	...	291 + 59	...	6 Rather slow.
(4)	1899,	Aug.	12–16	...	293 + 60	...	8 Medium.
(5)	1901,	,,	15	...	290 + 60	...	3 Rather swift, suspected.
(6)	1900,	,,	16–18	...	291 + 60	...	5 Slow.
(7)	1887,	,,	20–24	...	289 + 60	...	5 ,,
(8)	1879,	,,	21–25	...	291 + 60	...	56 ,,

Of all the meteors seen during the recent Perseid display, one of the finest appeared on August 12 about 11h. 12m. It was recorded at Bristol and at Stockport, and at the latter place Mr. J. P. Kenyon estimated that it burst out so brilliantly as to give a flash equal to the light of the full moon.

The object fell from a height of seventy-nine miles over Donington, Lincolnshire, to forty-four miles over Market Harborough, Leicestershire. Its length of visible course was fifty-two miles, and observed velocity forty-one miles per second. Other observers probably noticed this fine meteor, and I will be glad to receive further descriptions of its apparent path with a view to determine its real course more accurately.

There was another magnificent Perseid which gave a flash like lightning as it descended in the Milky Way north of Aquila, on August 13 at 14h. 10m., but the only account of this is one from Mr. W. Lucking, of Manuden, near Bishop's Stortford.

W. F. DENNING.

Bishopston, Bristol, August 19.

The Heating of a Balloon Wire by Lightning.

THE following account of the heating of a balloon wire by a lightning discharge is interesting as furnishing approximate limits for the energy of the discharge.

Report by Mr. S. F. Cody on Striking of a Balloon by Lightning on July 22, 1907.

"At about 11 a.m. on Monday, July 22, a captive balloon, carrying meteorological instruments, was in the air. Some 4500 feet of 19 S.W.G. tin-plated piano wire was between the balloon and the winch. The balloon was probably about 3500 feet high. The winch was exceedingly well earthed, standing on a large solid iron plate, which was also buried about 1½ feet in the earth.

"I was trying to locate the balloon, which was hidden by clouds at the time, when a flash of lightning came crossing horizontally, and then a quick stroke to the earth.

"Being unlike anything I had ever seen before, I set

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